G24-L to G30 migration

80393NT10089A Rev.2 – 2012-12-20

Making machines talk.

APPLICABILITY TABLE

PRODUCT
G24-L
G30

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1. Introduction

1.1. Scope

The purpose of this document is to provide G24-L customers with a general overview of the electrical and programming interface differences between G30 and G24-L, and provide a means to integrate the G30 product on a G24-L compatible platform.This document may be used as a reference which outlines the electrical, software and mechanical integration required for transforming a G24-L platform to operate with G30.

For further information and detailed specifications please refer to the Developer Manuals of each product.

1.2. Audience

This guide is intended for Telit's G30 customers.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit Technical Support Center (TTSC) at:

TS-EMEA@telit.com
TS-NORTHAMERICA@telit.com
TS-LATINAMERICA@telit.com
TS-APAC@telit.com

Alternatively, use:

http://www.telit.com/en/products/technical-support-center/contact.php

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

To register for product news and announcements or for product questions contact Telit Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

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1.4. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Document History

Revision	Date	Changes
0	2012-12-20	First issue
1	2013-01-02	Second issue

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2. General Information

The G30 GSM/GPRS module is available on a LGA 81-pin form factor, and with a 70 pin connector as well, maintaining the same mounting design as the '24' family. This model version is created for customers looking to draw on the G30 feature set, and wish to remain with connectorized solution.

2.1. Expanded feature list set

The following list of features will be available on G30 modules once migrated from G24-L:

- AT commands Interface and TCP/IP stacks compatible with the G24 family.
- Board to Board connector option
- High compatibility to the "24" family Form Factor and Pin-out.
- MUX over UART
- Telit AppZone: embedded application space
- FOTA
- Full Duplex Audio
- Embedded SIM chip technology

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3. Electrical Interface

Telit G30 module was designed with regards to electrical, mechanical and software compatibility to G24-L module. The following is delta within electrical interfaces and features that has to be considered when using G30.

Not supported features in G30:

- EDGE
- USB
- ADC3
- IGN

New supported features in G30:

- VRTC
- Esim- Embedded SIM
- Unit ready indication using reset signal
- FOTA ATs
- Appzone application: I2C, SPI

3.1. Power Supply

Telit G30 current consumption values are different than G24-L. Please refer to the Developer Guide for power consumption values details.

3.2. External Interfaces

Telit G30 supports the following interfaces:

- UART
- SPI for logging
- SIM card
- I2C (via Appzone SW package)

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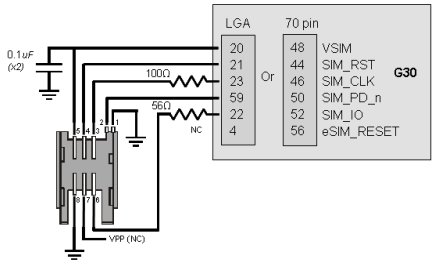
3.3. SIM Card

Telit G30 has an internal optional SIM chip and external interface to SIM connector same as G24-L.

In addition G30 module supports:

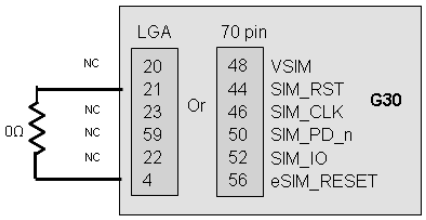
When external SIM is connected:

- Connect all SIM signals to the external SIM pins(VSIM , SIM_RST, SIM_IO, SIM_CLK, SIM_PD_n)
- Verify that eSIM_RESET (pin 56) is left unconnected



When eSIM is used:

- Verify that the following signals are not connected: VSIM, SIM_IO, SIM_CLK
- Connect SIM_RST pin to eSIM_RESET pin via O ohm resistor
- Connect SIM_PD_n pin to GND via O ohm resistor in case the SIM detection is disabled by SW (+MSMPD command)



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3.4. Audio

Differences in the audio output and input gain settings between G24-L and G30 may be noticed. Different gain levels for each path need to be set through AT commands, depending on the application.

G30 digital audio:

- PCM bus clock frequency 144 kHz
- I2S bus CLK - 512 kHz

3.5. Power ON/OFF management

It is important to note that the ON_N signal voltage level is different between the modules. In G24-L the ON_N signal is referenced to logic level.

In G30 the PWR_ON, when connecting the power supply for the first time or when reconnects it after a power supply loss, G30 will power-on. The G30 is turned-on automatically when external power is applied above the minimum operating level.

This difference may affect customers using this signal if their design does not follow the recommendation in the Developer Manuals:

"The PWR_ON input signal is set high by an internal pull-up resistor whenever a power supply is applied to the module. Therefore, ***it is recommended to operate this signal by using an open collector/drain circuit connection***."

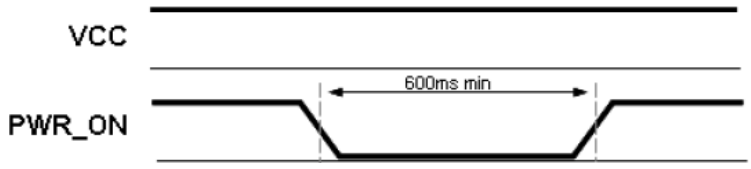
3.6. Power ON/OFF timing

Turning ON Using ON_N:

G24-L: Asserting the ON_N signal low for a minimum of 500 milliseconds and a maximum of 1.5 seconds will cause the G24-L to turn-on.

G30: Asserting the ON_N signal low for a minimum of 600 milliseconds will cause the G30 to turn-on.

The following figure illustrates the power-on process using the PWR_ON signal.



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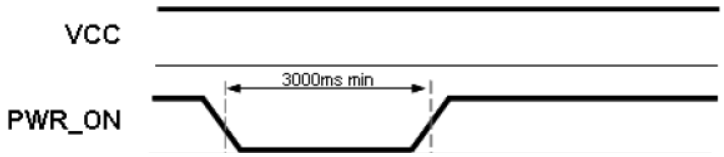
Turning OFF Using ON_N:

G24-L: Asserting the ON_N signal low for a minimum of 2 seconds.

G30: Asserting the ON_N signal low for a minimum of 3 seconds.

The following figure illustrates the power-off timings when using the PWR_ON signal.



3.7. Vref pin 27

Telit G30 can support current of up to 30mA, when in G24-L the current is 150mA.

3.8. RESET_IN (pin 25)

In G30 **input** is from module

In G24-L **output** is from module

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4. G30 module vs. G24-L interface connector signals

The following table describes the differences between the G24-L and G30 interface connector signals. Signals marked in color red have changed between G30 and G24-L.

Connector Pin #	G30	G24-L	Differences
1	GND	GND	
2	GND	GND	
3	GND	GND	
4	GND	GND	
5	VCC	VCC	
6	VCC	VCC	
7	VCC	VCC	
8	VCC	VCC	
9	RTS_N	RTS_N	
10		USB_VBUS	
11	RXD_N	RXD_N	
12		USB_DP	
13	DSR_N	DSR_N	
14		USB_DN	
15	CTS_N	CTS_N	
16	WKUPI_N	WKUPI_N	
17	DCD_N	DCD_N	
18	RXD_DAI	PCM_DIN	
19	DTR_N	DTR_N	
20	TXD_DAI	PCM_DOUT	
21	TXD_N	TXD_N	
22	CLK_DAI	PCM_CLK	G30 clock operates at 144 kHz I2S bus CLK - 512 kHz
23	RI_N	RI_N	
24	WA0_DAI	PCM_FS	
25	RESET_N	RESET_N	
26	WKUPO_N	WKUPO_N	
27	VREF	VREF	
28	GPIO1	GPIO1	
29			
30	GPIO2	GPIO2	
31			
32	GPIO3/SDA	GPIO3	
33			

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Connector Pin #	G30	G24-L	Differences
34	GPIO4/SCL	GPIO4	
35			
36	GPIO5	GPIO5	
37	ADC1	ADC1	
38	GPIO6	GPIO6	
39			
40	GPIO7	GPIO7	
41	ANT_DET	ANT_DET	
42	GPIO8	GPIO8	
43	ADC2	ADC2	
44	SIM_RST_N	SIM_RST_N	
45		UID	
46	SIM_CLK	SIM_CLK	
47		ADC3	
48	VSIM	SIM_VCC	G30 supports also 1.8V SIM cards
49	GPRS	GPRS	
50	SIM_PD_N	SIMPD_N	
51		IGN	
52	SIM_DIO	SIM_DIO	
53	PWR_ON _N	ON_N	
54	HDST_SPK	LCD_CS	
55	HDST_INT_N	HDST_INT_N	
56	eSIM_RESET	LCD_SD	
57	HDST_MIC	HDST_MIC	
58		LCD_CLK	
59	AGND1	AGND	
60	VRTC	LCD_RS	
61	MIC	MIC	
62	SPI_IRQ	SPI_IRQ_N	
63	SPKR_N	ALRT_N	
64	SPI_MISO	SPI_DIN	
65	SPKR_P	ALRT_P	
66	SPI_CLK	SPI_CLK	
67	SPKR_N	SPKR_N	
68	SPI_MOSI	SPI_DOUT	
69	SPKR_P	SPKR_P	
70	SPI_CS	SPI_CS	

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5. Mechanical Interface

The mechanical design is similar between G24-L and G30. The differences in the modules are in connectors and height, as described below.

5.1. Connectors

G24-L uses MMCX, while G30 uses U.FL connector for the radio RF interface.

The application interface connector is a single 70-pin, 0.5mm pitch, 2 rows, board-to-board interconnect type.

5.2. Dimensions

G24-L Dimensions (70 Pin connector)

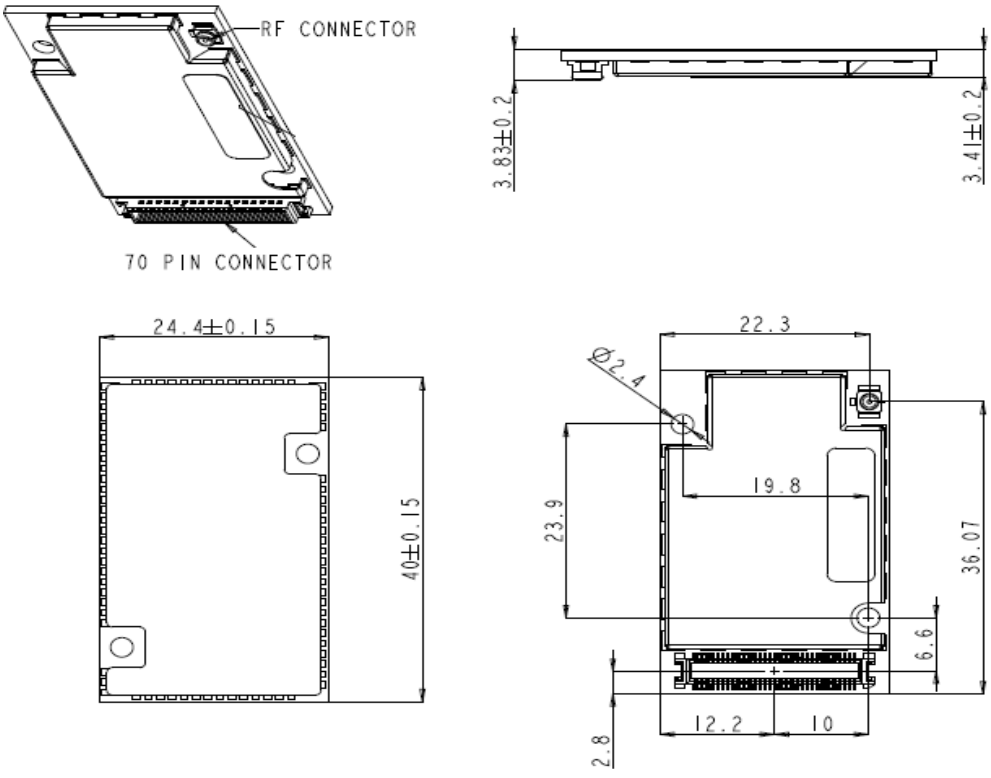
Physical: 24.4x45.2x.6.5mm

Weight <9g

G30 Dimensions (70 Pin connector)

Physical: 24.4x40x.3.5mm

Weight <6g



6. Software features G24-L vs.G30

The following table is providing a full overview on software features differences between G24-L and G30 modules.

To use commands that are equal to G24 Lite send command to the G30 module:

- AT+MSELINT = 1(default is “0”)
- AT+MRST

Feature	Status in G30	Values
USB	Not supported	
UART2	UART2 is Not supported	
E-mail	Not supported	
SSL	supported – future release	
FOTA	supported – future release	
Date Book	Not supported	
ME memory (SMS, PB)	Not supported	

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AT Commands – Removed		
EGPRS	EGPRS commands removed (CGEQREQ,CGEQMIN,CGEQNEG,CEG)	
+MEGA	Email Gateway Address Removed	
STK	Motorola commands replaced by IFX commands.	
+MFIC	Filter Incoming Calls, Removed	
+CTFR1	Reject incoming call, Removed	
+MNTFY	Removed	
+MCHARGE	Removed	
+MEGA	Removed	
+MDMIC	Removed	
+CVIB	Vibrator alert, Removed	
+MPDPM	PB dynamic Percentage Mem. Removed	
+TCLCC	List of current call Removed	
+MKPD	Keypad control Removed	
+TSMSRET	SMS Sending Retry Removed	
+TWUS	Wakeup Reason Set Removed	
+TWUR	Wakeup Reason Request Removed	
+TASW	Antenna Switch Removed	
+TADIAG	Query antenna ADC value Removed	
+MVREF	Motorola Voltage Reference Removed	
+MNTFY	Notify Indication Removed	
+MPSU	Second UART Removed	
+CKPD	Keypad Control – Not supported	
+CKEV	Keypress Echo – Not supported	
+CDEV	Display Indication – Not supported	
+MUPB	Phone Book Event – Not supported	
+CSNS	Single Numbering – Not supported	
+MDSI	Deactivate SIM – Not supported	
+MCSN	Change Subscriber Number- Not supported	
+MCSAT	SMS Alert – Not supported	
+MEDT	Enable/Disable Tone – Not supported	
+MEMISP	Removed	
+MEMAS	Removed	
+MEMGS	Removed	
+MEMDE	Removed	
+MEMSE	Removed	
+MEML	Removed	
+MEMR	Removed	
+MEMD	Removed	

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+MEMW	Removed	
+MFS	Frequency of Search – Not supported	
+MTDTR	DTR line – Not supported	
+MTCTS	CTS line – Not supported	
+MMAR	Removed	
+EMPC	Subsidy Lock – Not supported	
+MIPCSC,MIPSSL	SSL - Not supported	
+MIPCFF	Removed	
+EPIN	Removed	
+MGEER	GPRS Error – Not supported	
+MHDPB	Headset dual position – Not supported	
+MIAU	Removed	
Ignore commands	Backward compatibility, Removed	
FTS, FRH, FRM, FRS, FTH, FTM, FPR	Class 1 commands, Removed	
Phone Book Feature	Removed	
Fax Feature	Removed	
AT$	List of all available commands, Removed	

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AT Commands – Updated		
+MMICG	Range supported is 0-15	
ATI[n]	Updated	
+CRTT	16 Ring Tones instead of 41	
Character Set	Replace ASCII with IRA. UTF8 Removed	
Baud rate	Value 13 (460800), Removed	
FAX	Class 2	
+CPBS	1) AD, DC, EN, MC and RC – Removed 2) LD – Added 3) Replace SD with SN	Currently PB feature is not supported
+CPBS / +CPMS	ME/MT removed	Currently PB feature is not supported
+CSMS	Value 128, removed.	
+CIND/+CIEV	Different indications	
+CCWA	Indication will appear only once.	
GPIOs	Update to 9 GPIO pins	
S94, S96	Supported range, enlarged	
FTP	Use different sockets that the 4 for MIPOPEN	
+FTPRETR	In case of result 0 (operation failed) the FTP connection is close	
+CFUN	1) Range updated. 2) <rst>=0-<fun> value won't be saved in the flex/<rst>=1-<fun> value will be saved in the flex	
+MCI	Cell ID, LAC, Removed	
+CLCK	Will support subsidy lock feature	
MUX	Advance mode, Removed	
MUX	At commands per channel, Removed	
+CNMI	Range updated	
+CNUM	Support up to 2 strings	
Q, E, X	Read Mode, removed	
S register	Registers: 14,21,22,31,36,39,40 and 41 – Removed	
+CEER	Set and Read Mode, removed	
+CBST	Speeds 14(14400 bps (V.34), 68 – 2400 bps (V.110 or X.31 flag stuffing) and 75 – 14400 bps (V.110 or X.31 flag stuffing), removed	
+CBST	Value 1 from parameter <name> removed	
+GCAP	Read Mode, added	

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S register	S6, S8 and S18, assed	
+MIPCONF	The parameters: <keep_alive_timeout>, <keepalive_interval>, <keepalive_probes>, removed	
+MMAD	1) Only 2 converters 2) Average not supported	
+MAPATH/ +MAVOL	Alert speaker, removed	
Dial from PB	Only full equally string can be dial	Currently PB feature is not supported
+MIPSEND	when reached the watermark an unsolicited report of +MIPPUSH will be display	
Audio	While in advance mode, all basic commands are not block and will not return error. Only MAPATH will invoke advance mode.	
+CLVL / +MAVOL	The level value is added to the value was set in the other command and does not replace this value	
+CCWA	When no <class>, the default is 1	
+CGPRS	Value 2(EDGE), removed	
D, Dial	Limit of 54 digits	
+ICF	Values: 4,5,6,8 removed	
+CSMS	Parameter <service> updated	
+CNMA+CNMI	Commands updated	
+CSCA	Command updated	
+IPR	Values 300,600 removed	
+CGCLASS	Values CC and CG added	
+CSCS	CS 8859-1 removed	
+CSCS	HEX character set is treated as GSM	
+MIPSEND	Max size to send 504 bytes	
+CFUN	Remove second parameter <rst> from Set Mode	
+CFUN	When disable phone transmit & receive RF the module perform power down	
S94	0 = Disable sidetone	
+CPWD	All barring services use the same password	
S24	The G30 will wake up from sleep mode and timer will reset only in case the DTE wakes up the module. In case of a report to the terminal the G30 continue to sleep	
+CGDCONT	Parameter <cid> range is (1-2)	
+MCELL	Screens updated	
+CMER	Command parameters updated	
+CRSL	0 = lowest volume	

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SMS	When reading an incoming SM, the message header will be passed as usual. The DATA will be output in as received from NW without any conversions	

AT Commands – Added		
+CBAND	Change radio band	
+CTZU, +CTZR	NITZ commands	
+MTSM	Temperature sensor measurement	
+MADCM	Analog to digital measurement	
+CCID	Card ID	
+CSIM	Generic SIM Access	
+CGCMOD	PDP Context Modify	
\Q	Set Flow Control	
+MATONE	Tone Play	
+MMICV	Mic voltage value	

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